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ON THE *from the Author*
(6)

TREATMENT OF RHEUMATIC FEVER

IN ITS ACUTE STAGE,

EXCLUSIVELY BY FREE BLISTERING.

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NOTICE.

THE following pages have been reprinted from the *London Hospital Clinical Reports*.

Since its delivery, the Author has, in his Hospital and private practice systematically pursued the mode of treatment advocated in the Lecture, and has obtained such valuable results as to lead him to hope that the plan suggested presents the most efficient means of rapidly subduing the pain, limiting the duration and diminishing the tendency to the production of cardiac disease so characteristic of, Rheumatic Fever.

The cases which up to this date have been treated according to this system, amount to nearly fifty in number.

23, FINSBURY SQUARE,
Dec. 10, 1864.

ON THE TREATMENT OF
RHEUMATIC FEVER IN ITS ACUTE STAGE,
EXCLUSIVELY BY FREE BLISTERING.

GENTLEMEN,—I propose this morning to make some observations on the treatment of acute rheumatism, and especially with reference to the plan which you have lately seen me systematically pursuing in the wards of this Hospital. I will call it the treatment of Acute Articular Rheumatism by free blistering without the aid of alkalies, nitre, lemon-juice, bark, opium, colchicum, or, in fact, any of the internal remedies which are and have been considered as specifics in that affection. The treatment has been *absolutely and entirely* local—the cases subjected to it have been for the most part of a marked acute character—and the results, in rapid relief of the pains, quick convalescence, and freedom from cardiac disease, highly satisfactory. I have been greatly assisted in the daily observation of the cases by Mr. George Mackenzie and Dr. Woodman, who have carefully collected the facts every twenty-four hours, and have arranged them in tabulated forms, which I believe will be found to contain some curious and valuable information.

I need not detain you with any lengthened detail of the symptoms of the disease. All the cases to which I shall have to refer presented more or less, the quick, full pulse, varying from 80 to 120 beats in a minute, the hot and acid-perspiring skin, the marked thirst and total loss of appetite, the creamy and usually moist tongue; the scanty, high-coloured and extremely acid urine; and lastly, the acutely painful, hot and swollen joints. The morbid reaction of the perspiration, saliva and urine characteristic of what is called rheumatic fever, pointed to the presence within the system of a *materia* poisonous either from excess of a normal element, or as a

new product, intensely acid in its nature and highly irritating to the synovial and fibrous tissues; and upon the rapid expulsion of this poisonous and irritating agent depended the safety and the cure of the patient, and his immunity, above all, from endo- or peri-carditis. Believing it probable that the virus localized itself for a time in the inflamed joints, and that the intensity of the local inflammations was a measure to some extent of the amount of poison collected by a species of affinity in the parts attacked, I determined to attempt the local elimination of the *materies morbi*, wherever any external manifestations of its presence existed. I ordered blisters, varying in width, but of considerable size, according to the locality, to be applied around each limb and in close proximity to the parts inflamed; and I hoped to relieve the affected joints, partly on the principle of derivation, but *mainly* and really by affording through the serous discharge from the blistered surface, a ready means of exit for the animal poison. Arm-lets, wrist-lets, thigh-lets and leg-lets, and even finger-lets (if I may be allowed to coin such words) were applied near to, but not upon *every joint inflamed*, at the very *height* of the inflammatory stage when the local pains were the most severe, and the constitutional disturbance the *greatest*. I will give you an abstract of a few of the cases and the results:—

CASE 1.—Was a decidedly acute case occurring in an individual of a very delicate and unpromising appearance. Six blisters were applied simultaneously and one subsequently. Great and almost immediate relief to the joints was afforded as soon as the serum commenced to be discharged. The pulse in twenty-four hours fell from 120 to 88 in a minute, and the urine *lost its acidity* in the same time; I mean in twenty-four hours from the time the blisters were removed. I should mention, that most of the cases were admitted in the afternoon, and that the blisters were applied in the evening, and removed the following morning. This must be borne in mind in reading the tables annexed. In this case every joint was perfectly moveable and free from pain on the eighth day after admission. The appetite began to be restored on the sixth day; light pudding was ordered on the tenth; fish on the fourteenth, and meat diet on the eighteenth day from the time he entered the Hospital.

On the tenth day he was allowed to walk about the ward; and as he was anæmic, the ammonio-citrate of iron was ordered and continued until March 30th when he was discharged cured.

The rheumatic fever in this case terminated within a week, but the convalescence was somewhat prolonged as his constitution was feeble. He remained altogether five weeks in the Hospital. No morbus cordis was developed.

CASE 2.—Had five blisters applied simultaneously. The pulse fell from 118 to 92, in twenty-four hours from the removal of the blisters. The urine became *neutral* in reaction in a shorter space of time, and soon resumed its normal acidity. Great and immediate relief followed upon the discharge from the blistered surfaces, and perfect mobility of the joints was obtained on the third day from admission, when the pulse had fallen to 80 per minute. The appetite returned on the fifth day. Fish was ordered on the seventh, and meat diet on the eleventh, and he was discharged cured on the eighteenth day. No morbus cordis was developed.

CASE 3.—Had six blisters applied on admission, and one subsequently. The pulse fell from 96 to 80 in twenty-four hours from the removal of the blisters, and the urine became *neutral* in a less period of time. Great relief was afforded, and mobility of the joints was established on the third day. Appetite returned on the third, fish was allowed on the eighth, and meat diet on the twelfth day.

This patient had a distinct mitral murmur on admission, which was unaltered when she left the Hospital. The case was of a severe and acute character, and she had been nine days in bed previously to coming under treatment. On the fourth day a blister was applied near the left wrist, which had been till then unaffected by the rheumatic virus.

She remained twenty eight-days in the Hospital.

CASE 4.—Had six blisters applied simultaneously. The pulse fell from 100 to 88 in twenty-four hours from the removal of the blister, and the urine was only slightly acid on the day following

admission. On the succeeding day the urine was *neutral*, and deposited crystals of triple phosphate, which were recognized under the microscope, and by the usual nitric acid test.

The joints were rapidly relieved, and mobility soon re-established.

The appetite returned on the fourth day, and he was discharged cured on the eighteenth day. The case was very acute, and the temperature in the axilla high. The heart was unaffected.

CASE 5.—Was a delicate female, aged 18, who had already suffered from rheumatic fever. On admission, the joints affected were only one shoulder and the wrists; but the right elbow-joint became subsequently severely inflamed. Four blisters were applied with the usual beneficial result. An undoubted regurgitant mitral murmur was audible on the day of admission, and the respiration was short, and hurried, and difficult, although no pulmonary physical signs could be detected to account for the dyspnoea. The cheeks presented a somewhat livid appearance, and there was an evident embarrassment of the heart's circulation, consequent upon a (most probably) recent deposition of lymph upon the valve. These symptoms rapidly disappeared upon a free discharge of serum being established: and when she left the Hospital (twenty-eight days after admission), *no trace of mitral murmur* could be detected. Is it possible that the serum of the blood, being restored to its normal degree of alkalinity by the removal of the acid materies morbi, was enabled to re-dissolve a slight layer of lymph which had been deposited on the valve, and had produced the murmur and the embarrassed breathing?

The pulse was 96 on the day of admission; but on the next day rose to 116, and then fell to 84. The patient was delicate in constitution, and subject to severe indigestion and irritability of stomach—for which, after she had been allowed to walk about the ward, it was found necessary to prescribe bismuth and hydrocyanic acid. Strong broth and sherry were allowed on the ninth, fish on the fourteenth, and a chop on the twenty-second day. She remained under treatment twenty-eight days.

CASE 6.—Was one of great interest, as the affection was very

severe, the man helpless, and the relief afforded so manifest. Here seven blisters were applied simultaneously, and three subsequently.

The pulse (although the case was very acute) was only 80 on admission. It fell, in forty-eight hours after the blisters were removed, to 68, and afterwards to 60, at which it remained, when he was discharged cured.

The temperature in the axilla stood, on admission, as high as 103° , and fell eventually to the normal 98° . The urine scanty and acid at first, became more abundant and neutral on the fourth day.

The case was most instructive to watch—as so many joints were acutely inflamed—the thirst intolerable, and perspiration intensely acid and abundant. He had not slept for a week previous to coming under treatment; and yet, after the removal of the seven blisters, his pains were so much relieved as to allow him to have six hours of continuous sleep. A slight relapse occurred upon two following days, when one and two blisters were respectively applied, and with the most favourable results. All traces of the rheumatic affection were removed in six days, and he was discharged cured, on the sixteenth day after his admission. On questioning him respecting the pain he had suffered from the blisters, he expressed himself most grateful for the application, adding that “he would prefer to have forty blisters applied than undergo the agony caused by rheumatic fever.”

The heart was unaffected.

I will not stay to analyze each case, but I cannot refrain from giving some details of the last instance which I have had to tabulate.

CASE 13.—A large-made, plethoric, beer-drinking carpenter, was admitted one Thursday evening with most severe articular rheumatism, affecting seven joints.

The pulse was 120, and hard; the temperature of the left axilla as high as 102.5° ; the urine, perspiration, and saliva intensely acid; thirst excessive; appetite nil, and tongue foul. He had had no sleep for four nights. Seven large blisters were applied next (Friday) morning, around each limb affected, and in close proximity to the inflamed joints. I saw that they were carefully put on. On the Saturday morning they were removed, and linseed meal poultices

kept on for sixteen hours. By this means a large amount of serum flowed away, and on that (Saturday) morning the pulse had fallen to 86, the axillary temperature to 99.5° ; the urine had become *absolutely alkaline*, and although the thirst was still great, he had some return of appetite. He had lost all pain in his limbs, and his joints were freely moveable. On Sunday he was dressed and sat up for three hours. On Monday he was so far recovered as to be able to walk by the aid of a stick; and on Tuesday morning on entering the ward, I found that he had risen and dressed himself of his own accord. The appetite was then good, and he declared himself to be only weak. He had eggs on the Monday, fish on the Tuesday, meat on Friday, and was discharged perfectly well on June 18th, after being sixteen days in the Hospital.

His heart was perfectly sound at the time of his discharge.

Being an intelligent man, and accustomed from his business to measurement, I desired him to write me out a short account of his ease, and to calculate how much blister-plaster had been applied to his skin. The following is his letter, from which it appears that taking the mean of the thigh measurements to be sixteen inches, the number of square inches of blister-plaster amounted to $296\frac{1}{2}$. No symptom of strangury appeared, and no inconvenience whatever beyond the pain to which he alludes. Their beneficial effect was rapid and complete, and their constitutional action, exhibited in the fall of the pulse from 120 to 86, and the production of *alkalinity* of the urine, as soon as full discharge of serum had been established :—

June 16th, 1864.

SIR,—The following is a true statement of my case, to the best of my knowledge and belief. I entered the London Hospital on Thursday the 2nd day of June, and was treated in the following manner :—

June 3rd.—Received application of seven blisters on different parts, viz., one on left shoulder, three by three inches and a-half; one on each thigh, seventeen inches and a-half at greatest length, and sixteen inches and a-half at lesser length, with a width of five inches: one near each ankle, ten inches by four; one near each wrist, eight inches by three inches and a-half. I received relief from rheumatic pains immediately the blisters began to draw. At midnight on the 3rd inst. they caused me much pain.

4th.—The blisters were dressed at 4.30 A.M., and linseed-meal poultices applied, which were continued till 8 P.M., when they were dressed with zinc

ointment. In the meantime the rheumatic pains had almost entirely left me.

5th.—I got out of bed, and dressed with the assistance of a fellow-patient. Sat up three hours, the rheumatic pains having entirely left me.

6th.—Dressed myself without assistance; felt rather stiff; was able to walk about the ward with a stick. Sat up five hours.

7th.—Could walk about the ward without a stick.

8th, 9th, 10th, 11th.—The skin having healed up, I could walk as well as ever.

I have the honour to be, Sir, your obedient servant,

Dr. Herbert Davies.

J. B.

P.S.—The following particulars I forgot to mention in the preceding part of this letter :—

I was attacked with pains in my left shoulder on Sunday the 22nd of May, but I did not know what was the cause; I thought it was only a cold. It got to my left leg at night. On the 23rd I got worse. I was told that I had the rheumatic fever. Had some medicine and a powder given me, and was ordered to apply hot bran poultices to my shoulder, and to bathe my ankles (where I felt most pain) with a solution of soda and water as hot as I could bear it.

I got so much worse, that I was compelled to lie in one position (on my back) for several days, the agony being intense. I remained in this state till the 2nd of June, when I was got down stairs with much difficulty, placed in a cab and brought here, and was received into Harrison's ward at 3.15 P.M.

J. B.

Returning to this plan of treatment, I must impress upon you forcibly the fact that its success depends entirely upon the blisters being well applied and allowed to remain until they have thoroughly acted. Linseed-meal poultices subsequently applied will be found highly serviceable in promoting a sufficient flow of serum. The blisters should be placed entirely around the affected limb, and when the knees are inflamed, I order them to be cut at least three inches wide. You need have no fear of strangury supervening. In one case only did this inconvenience occur, but to so slight a degree as to be unworthy of mention, compared with the benefit afforded by the free vesication.

It will be observed that in none of the cases tabulated was any medicine given, beyond an occasional purge. At one time I associated in some previous cases the alkaline with blister treatment, but I found no advantage to result from the combination. On the contrary, I came to the conclusion that when a full discharge of serum had been established, the addition of alkalies to the blood did

not cut short the inflammation and its attendant agonizing pain, but rendered the period of convalescence more protracted. The altered constitution of the blood produced by perseverance in an alkaline treatment leads to a depression of general power too well known to require comment. I think it is reasonable to infer that if the acid materies morbi be really eliminated bodily, and the system rid of its prejudicial influence by the blister treatment, any amount of alkali internally administered would be not only useless, but injurious to the patient; and that the poison is really thrown out may be deduced as well from the rapid and permanent relief resulting from the local treatment, *as from the neutral and even alkaline condition of the urine*, the usual and early consequence of the treatment. The most important result observed in the cases thus locally treated was the rapid diminution in the force and frequency of the pulse, and the immunity of the heart from inflammatory mischief. In no case where the heart was sound at the time of admission, did any organic lesion subsequently develop itself; and in two cases in which soft but distinct mitral murmur was audible when the patient came under treatment, every trace of the sound rapidly disappeared as soon as free and abundant serous discharge had been established. I have already hypothetically explained this favourable result by supposing that a change effected in the alkalinity of the blood by the removal of the acid materies morbi from the discharging surface enabled that fluid to re-dissolve the lymph recently deposited on the surface of the valve.

Experiments are much needed to determine the degree and range of alkalinity of the blood of healthy individuals, and of those suffering from rheumatic fever. A comparison of the two would lead, I believe, to valuable inferences. I trust that we may be able to work out a portion at least of this problem within the next few months. Still, whatever may be the *rationale* of the treatment, there can be no doubt that our cases bear out most fully its immense value in shielding the heart from an organic lesion which would cripple it for life and render existence a burden. I do not doubt the value, to some extent, of the chemical neutralizing method of treatment, by alkalis rapidly and largely poured into the system. But *direct* elimination is evidently more likely to succeed than simple neutralization and possible subsequent elimination

by the kidneys. The lactate of potash resulting from the alkaline treatment may not be fully thrown out by the kidneys—part may be detained in the blood, and, becoming again decomposed, its acid constituent may be once more thrown upon the synovial and fibrous tissues, and lead to the relapses which occur during the alkaline treatment of the affection. The elimination which I have advocated, strikes at the root of the evil itself by drawing the poison at once from the system, or in such quantities as leaves only a residue in the blood, which the oxydizing and other chemical powers of that fluid can fairly cope with and destroy. Relapses under the blistering treatment have been so far very slight, and by no means frequent.* An extended series of cases is of course required to confirm these views; but as far as the experience of nearly twenty-five instances will admit (thirteen of which I have carefully tabulated), I believe that in the plan which I have laid down—of *elimination*, and not *neutralization*, resides the true, safe, and rapid mode of combating rheumatic fever.

Many interesting questions arise in the consideration of this treatment.

What is the nature of this power of affinity between certain substances and certain tissues? We see this force exemplified in numberless cases, as, for instance, in the deposit of lead in the muscles, of mercury in the bones, of arsenic in the liver, of silver in the brain and skin, &c. We observe it clearly in gout, in the crystalline, needle-like crystals of urate of soda, which are deposited *interstitially* in cartilage, and which incrust “ligamentous and fibro-cartilaginous tissue, tendons and their sheaths;” and are also found in white, streaky lines, in the substance of the kidneys. The same force is shown in the preference of morbid poisons for different parts of the body, as in scarlatina, whooping-cough, measles, hydrophobia, syphilis, &c. No one has separated, and isolated, and brought to chemical examination and analysis any of these poisons; but, although, up to the present time, they have escaped the penetration and patience of the chemist, there can be no shadow of doubt of their positive existence. Lactic acid is, with some reason, supposed to be the materies morbi

* “Relapse occurs more or less decidedly in twenty-five out of one hundred and nine cases treated in the ordinary way.”—On *Rheumatic Fever*, by Dr. Wade.

of acute rheumatism ; but as yet the evidence is too incomplete to establish this statement as a fact.

Again, for what length of time does this affinity—this power of attraction between poison and tissue continue? It is indeed difficult, if not impossible, to answer this question ; but the condition of the poison, its persistent fluidity, or rapid tendency to crystallization, will go far to determine the probability of its being removed by such means as blistering. There is no evidence to shew that the poison of rheumatic fever—supposed to be the lactic acid, is ever deposited as a solid, while Dr. Garrod tells us that true gouty inflammation is *always* accompanied by a crystalline and interstitial deposit of urate of soda, which is infiltrated into the cartilages and ligaments, and remains there for a lengthened period of time, and perhaps for life. We can readily understand, then, how the fluid poison of acute rheumatism may be readily expelled from the system by setting up large discharging surfaces in the proximity of the poisoned joint ; and, on the other hand, how the same amount of benefit cannot be readily expected from similar treatment in gout when the solid crystalline urate of soda has become deposited interstitially and beyond the pale of the circulation. I have no doubt that in the earliest stage of the joint affection, when the urate is still in the blood stream, some amount of elimination and consequent relief might be effected by free blistering ; but, unfortunately, the rapid tendency of the poison to crystallize, steals a march upon our local efforts and renders them abortive. Still there can be no objection to the employment of blisters : and I have in some cases seen considerable relief effected by the application ; but relapse has not been infrequent—a circumstance readily understood when we remember that we have been unable to remove a substance already part and parcel of the tissues.

Dr. Garrod has established the fact that uric acid can be usually detected in the blister-serum, derived from every portion of the surface of a gouty individual, except from the skin of the inflamed joint—the gouty inflammation appearing to him to have the power of chemically destroying the virus. Is it possible that the urate does not appear in the blister-serum, obtained direct from the joint, for the simple reason that it is rapidly separated from the blood, thrown into the tissue, and therefore really absent from the fluid ?

In the very large large majority of cases, the poison of acute rheumatism fortunately tends more especially to the joints rather than to similar structures in the heart. It would appear also, from the cases before us, that the application of the blisters restrains the tendency of the acid poison to desert the limbs for the heart. Hence I infer the immense importance of *simultaneously attacking* every joint—great or small—which, by the slightest appearance of inflammation, indicates within the tissues the presence of the rheumatic virus. And I may say with some amount of confidence, derived from the observation of twenty-five cases, that we may fairly hope and expect, by bold and efficient treatment, to deprive this fearful affection of its most dreaded result—organic disease of the heart.

Cases are met with, I admit, where the poison appears to attack the heart before exhibiting its effects in the joints. Happily, these are very rare. Alkalies must be, in such cases, our main mode of treatment, until evidences are shewn of the joints becoming affected, when full and efficient blistering may so throw out the rheumatic virus from the system, as not only to relieve the joints, but, perhaps, the heart also, as I have shewn to have occurred in two of the cases which I have tabulated.

It will be seen that daily thermometrical observations have been made in most of the cases of the temperature of the affected joints, and that, as a rule, the diminution of the local inflammation has been attended with a corresponding fall in the heat of the affected part. The variations are, however, difficult to refer to any law, and I believe that real dependence for prognosis can only be placed upon the temperature in the axilla, where the thermometer can be well embedded and protected from atmospheric influences. The tables shew that the axillary temperature almost invariably falls with the discharge of the serum. Hence I infer, that the general cooling of the blood must be a direct consequence of this mode of treatment, and that this fluid being restored to its usual degree of alkalinity by being deprived of the acid poison which it previously contained, ceases to stimulate the heart to the abnormal degree characterizing the acute stage of the fever.

The organ loses its excessive irritability, as shewn by the diminished force and frequency of the pulse, and every tissue and structure is, coincidently, favourably influenced in a degree corresponding

with the diminished temperature and restored amount of alkalinity of the circulating blood. I propose in future to confine my thermometrical observations to the variations of the axillary temperature, believing that we shall find in that part of the body the safest and most trustworthy indication of the real condition of the patient. Dr. Woodman has kindly observed the temperature of twenty-one healthy individuals of all ages, and the results, although derived from a limited number of cases, are interesting, and may be valuable in what I may term comparative thermometry. It will be seen that the variations are very great, and not easy of explanation.

Lastly, as to the practicability of the mode of treatment in private practice. Although it looks indeed severe to apply so many square inches of blister plaster simultaneously to an individual already suffering intense agony, and burnt up with inflammatory fever, still a little tact and determination on your part will overcome the scruples of the most timid patient. Supposing the case to be one of uncomplicated—*bond fide*—acute articular rheumatism, you can with certainty promise speedy relief to his sufferings, and may, I believe, with equal truth assert that, if not attacked already, his heart, by this bold and decisive treatment, will be shielded from inflammatory action and permanent structural disease. In my own experience I have found the latter argument to be irresistible.

The detection of the lactic acid, or whatever acid it may be, in the discharge from the neighbourhood of the inflamed joint, would be a valuable and conclusive evidence of the correctness of the theory and the treatment. I append the following report from my friend, Mr. Fewtrell, an accomplished analyst, of his examination of the fluid. I trust we may be able eventually to isolate the *materies morbi*.

“Some attempts were made to determine the presence of lactic acid in the serum from the blisters. Unfortunately the determination of the ‘presence of lactic acid is one of the most difficult tasks in analytical animal chemistry,’* and the results of these attempts can hardly be looked upon as conclusive.

The method adopted to separate the acid was the following:—

The serum, which was in all cases faintly alkaline, was at first

* Lehman, *Physiological Chemistry*, vol. i. p. 90. Dr. Day's translation.

treated with three or four times its bulk of alcohol, to separate the albumen. (It should be premised that the albumen of serum does not coagulate, but only gelatinizes on the application of heat.) Alkaline lactates are soluble in alcohol, and therefore would be found in the alcoholic solution filtered from the albumen. This solution was now evaporated almost to dryness, and the residue treated with sulphuric or oxalic acid. The mixture was then shaken up with ether, in which the lactic acid set free would dissolve. The ethereal solution was then removed by means of a pipette, and allowed to evaporate spontaneously. In every case a very small quantity of *acid* residue was obtained: this was mixed with a little water, neutralized with lime, oxide of copper, or oxide of zinc, filtered and evaporated. In no case, however, in consequence of the presence of a small quantity of animal matter, could crystals be procured sufficiently distinct to determine their nature by the microscope."

P.S.—The brief details of the following case, for which I am indebted to Mr. Daly, as occurring in the practice of Mr. Mundie, of Richmond Road, Dalston, will prove, I believe, interesting.

"June 26th, 1864.—C. O., aged 18, presented the usual symptoms of acute rheumatic fever; pulse, 124, tongue creamy, skin covered with acid perspiration, urine scanty and high-coloured, the right shoulder, right knee and elbow, hot, swollen, and exquisitely painful. She had had no sleep the previous night. No heart complication.

Ordered,	Potassæ Bicarb	ʒiii
	Potassæ Nitrāt.	ʒj
	Syrupis	ʒj
	Aquæ dest. ad.	ʒvj ʒj 4 ^{tis} horis,

and five grains of Dover's powder at bed-time. Joints to be wrapped in wool.

"June 27th.—Rather worse; no sleep; slight delirium; the left ankle now affected in addition to the other joints.

"Rep. mist. alkal.—The joints to be painted with strong Tinct. Iodinii.

"June 28th.—No improvement; the right shoulder not quite so painful, but the left knee is now severely inflamed. Other symptoms as before. Was again delirious last night.

"June 29th.—No improvement. Was now ordered wide strips

of Empt. Lyttæ around each limb, and above the inflamed joints, and as the urine had already become alkaline, the medicine was discontinued.

“*June 29th.*—There is a free discharge established from the four blistered surfaces. The patient states ‘that she feels quite comfortable; that the pain of the blisters while they were applied was great, but that they had cured the pain, and that she would rather endure them over again than have it back.’

“I did not remark the exact number of the pulse, but was struck with the sudden abatement of all the febrile symptoms.

“I gave her no medicine, the urine was still neutral.

“*June 30th.*—Has passed a good night, and feels very much better.

“*July 1st.*—The left wrist is rather painful, and I have ordered another blister to be applied above it.

“From this date the patient rapidly recovered, without any other treatment beyond a little chalybeate medicine.

“There was no heart complication from first to last.”

It is evident from the details of this case that the *chemical* production of alkaline urine by the internal administration of alkalies is no proof that the acid materies is *fully* neutralized and eliminated. The alkaline condition of the urine only proves that the alkali absorbed into the circulation has passed off in such quantities by the kidneys as to be able to neutralize and overpower any normal or abnormal acid making its exit in that direction from the body. The tendency of alkalies to run off by the urine is easy of demonstration. “Mr. Brande states that two drachms of carbonate of soda rendered healthy urine alkaline in six minutes, occasioning the precipitation of triple phosphate in a quarter of an hour, and restoring the blue colour to reddened litmus paper.”* It is probable that a portion of the acid virus of rheumatic fever lingers at the joints, being detained in the tissues by some powerful force of affinity, and while inducing acute inflammatory action, eludes the antagonizing effect of the alkaline remedies introduced into the stomach. Another portion free and uncombined with the tissues, very probably becomes neutralized by the alkali, and eliminated by means of the kidneys.

* Pereira's *Mat. Med.*, vol. i. p. 177.

The neutral and *frequently* alkaline condition of the urine resulting from the blister treatment, can only result from so much acid being withdrawn from the blood by the application. The neutrality or alkalinity in this case is a measure, therefore, of the quantity of *materies morbi* actually evacuated, while the alkalinity from the potash treatment is not necessarily a measure of the amount of acid virus neutralized and expelled, but rather of the quantity of alkaline remedies thrown into the calculation.

CASE I.

Admitted.	Name and Occupation.	Age.	Sex.	Constitution.	Number of Attack.	Character of Attack.	Duration of a tack before Admission.
February 23rd	W. S.—Turner	21	Male	Weakly	First	Acute	Six days

February . .	23rd	24th	25th	26th	27th	28th
Pulse . . .	120	120	88	92	100	96
Temp. in Axilla	102°	101°	100°	100°	100°	101°
Temperature and mobility of joints affected.	R. W.	—98°—Fixed	—93°—Slight motion	—97°—Slightly improved	—96½°—The same	—96°—Free
	L. W.				—98°—Slight motion	—97½°—The same
	R. E.					
	L. E.	—96°—Slight motion	—98°—Still the same	—98½°—Slightly improved	—98°—Good	—96°—Ditto
	R. K.	—100°—Fixed	—96½°—Fixed	—96°—Good	—97°—Good	—96°—Ditto
	L. K.	—99°—Slight motion	—98°—Fixed	—98½°—Good	—96°—Not so good	—99°—Slight motion
	R. A.	—96°—Fixed	—99°—Fixed	—94°—Good	—89°—Good	—91°—Good
	L. A.	—97°—Fixed	—98°—Fixed	—95°—Good	—94°—Not so good	—96°—Slight motion
Blisters applied	Six	—	—	—	One above left wrist	—
Perspiration .	Profuse, Acid	The same	ditto	ditto	ditto	Very slight—Acid
Urine . . .	Scanty, high-coloured, acid	The same	Slightly increased, neutral	Quantity slightly increased, neutral	The same, neutral	Very slight acid
Tongue . .	Creamy	The same	ditto	ditto	Cleaning	Still cleaning
Thirst . . .	Excessive	The same	ditto	ditto	ditto	ditto
Appetite . .	Bad	Still bad	ditto	ditto	Very slightly better	The same
Amount of sleep	He had not slept for four nights	Did not sleep on account of the blisters	Very slight	Four hours	All night	Kept awake by the blister
Bowels, Action of	Regular	Regular	The same	The same	ditto	ditto
Diet	Milk and beef-tea	The same	ditto	ditto	ditto	ditto

C A S E I.—*Continued.*

Morbus Cordis at Admission.	Days in the Hospital.	Morbus Cordis at Discharge.	Discharged.
None	36	None	March 30th

29th	March 1st	2nd	3rd	4th	5th
92	84	80	86	96	86
100°	100½°	100°	98°	97½°	99°
98½°—Free	—96½°—Free	—98°—Free	—97°	—94½°	—96°
96°—Free	—96½°—The same	—99°—Free	—96°	—96°	—97°
out painful			All freely moveable, but slightly stiff.	The same.	Perfectly free from stiffness.
97°—Free	—98½°—Free	—98°—Free	—98½°	—97°	—96°
98½°—The same	—98°—Free	—98°—Free	—98°	—96½°	—98°
94½°—Free	—90°—Free	—97°—Free	—95°	—92°	—94°
94°—The same	—87½°—Free	—95°—Free	—92°	—90°	—94°
—	—	—	—	—	—
Increased	The same	Ceased	Still Absent	The same	Normal
Quantity, in- creased, triple phosphates precipitated	Normally acid	Neutral	Neutral.— Phosphates precipitated	Good quantity, neutral	The same
much cleaner	The same	The same	Almost clean	The same	The same
less	Still less	ditto	ditto	Normal	Normal
improving	The same	The same	Feels hungry	Good	Good
1 night	Badly	Badly	Six hours	Six hours	All night
inclined to be constipated	The same	Not open.— Ordered an aperient draught.	Regular	ditto	Regular
to	ditto	ditto	ditto	L. P. in addi- tion	ditto

CASE II.

Admitted.	Name and Occupation.	Age.	Sex.	Constitution.	Number of Attack.	Character of Attack.	Duration of attack before Admission.
February 26th	W. M.—Labourer	32	Male	Robust	First	Acute	Six days

February . .	27th	28th	29th	March 1st	2nd	3rd
Pulse . . .	118	90	92	80	73	70
Temp. in Axilla	100°	100°	98°	99°	98°	98°
Temperature and mobility of joints affected.	R. W. —98°—Slight motion L. W. —98½°—Slight motion R. K. —98½°—Slight motion L. K. —100½°—Fixed R. A. —98°—Slight motion L. A. —99°—Slight motion	—98°—Moveable but stiff —97½°—Moveable —96½°—Moveable without pain —97°—Moveable with pain —92°—Moveable without pain	—96°—The same —96°—Moveable —96°—The same —96°—Moveable —96°—The same	—90°—Free —95°—Free —95°—Free —93°—Free —96°—Free	—88°—Perfect —95°—Perfect —95°—Perfect —93°—Perfect —90°—Perfect	—93½°—The same —94°—The same —96°—The same —91°—The same —87½°—The same
Blisters applied	Five	—	—	—	—	—
Perspiration .	Acid, but not profuse	Increased—Slightly acid	The same	ditto	ditto	ditto
Urine . . .	Scanty—Acid	Scanty—neutral	Quantity increased.—Slightly acid	ditto	ditto	Normal—Quantity, colour, and acidity
Tongue . .	Moist and white	The same	ditto	Cleaner	ditto	Almost clean
Thirst . . .	Slight	The same	Rather less	Less	The same	Normal
Appetite . .	Bad	Slightly better	ditto	Better	ditto	Good
Amount of sleep	Two hours	Five hours	Seven hours	Six hours	Seven hours	Six hours
Bowels, Action of	Regular	ditto	ditto			
Diet . . .	Milk and Beef-tea	ditto	ditto		L. Pudding	

CASE II.—*Continued.*

Morbus Cordis Admission.	Days in the Hospital.	Morbus Cordis at Discharge.	Discharged.
None	18	None	March 15th

4th	5th	
64	72	
98°	97½°	
86°	—85°	Ditto.
86°	—94°	
84°	—94°	
81°	—89°	
88°	—89°	
—	—	
Normal	Normal	
Normal	The same	
The same	ditto	
Normal	ditto	
do	ditto	
hours	All night	
	Fish	Middle diet on the 9th.

CASE III.

Admitted.	Name and Occupation.	Age.	Sex.	Constitution.	Number of Attack.	Character of Attack.	Duration of attack before Admission.
March 8th	G. S.— Sealemaker	24	Male	Robust	First	Acute	Nine days

March . . .	8th	9th	10th	11th	12th	13th
Pulse . . .	96	92	80	86	86	84
Temp. in Axilla	103°	102°	100°	101°	100°	100°
Temperature and mobility of joints affected.	R. S.	—103°—Slight motion	—102°—Slight motion without pain	—100°—Moveable without pain		
	R. W.	—98°—Moveable with great pain	—98°—Moveable without pain	—98°—Movement free	—95°—Free	—90°—Perfect
	L. W.					—97°—The same
	R. K.	—100°—Slight motion	—100°	—97°	—92°—Slight movement with pain	—96°—Moveable without pain
	L. K.	—101°—Slight motion	—100°	—98°	—99°	—96°
	R. A.	—100°—Slight motion	—94°	—93°	—99°	—98°
	L. A.	—98°—Slight motion	—94°	—95°	—92½°	—95½°
Blisters applied	Six	—	—	One	—	—
Perspiration .	Excessive, acid	The same	Less	Increased	Less	Much less
Urine . . .	Normal quantity, acid	The same—neutral	The same	ditto	ditto	The same.—Very slight acid
Tongue . . .	White, moist, and coated	Much cleaner	The same	Rather white again	Cleaner	Slightly white
Thirst . . .	Excessive	The same	The same	The same	The same	The same
Appetite . . .	Very bad	Slightly better	Better	Good	Good	Good
Amount of sleep	He had not slept for three nights	Did not sleep on account of blisters	Six hours	Three hours. Kept awake by pain in left wrist	One hour and a half	Six hours
Bowels, Action of	Regular	Regular	Regular	Regular	ditto	Confined
Diet	Milk, Beef-tea	ditto	ditto	ditto	ditto	ditto

CASE III.—*Continued.*

Morbus Cordis on Admission.	Days in the Hospital.	Morbus Cordis on Discharge.	Discharged.
Mitral	28	Mitral	April 5th

14th	15th	16th	17th	
80	76	88	80	
100°	99°	100°	100°	
93°—ditto	—96°—ditto	—92°	—92°	Free.
94°—Perfect	—95°—ditto	—92°	—92°	
98°—Quite free	—97°—Perfect	—97½°	—98°	
98°—Slight- stiff	—98°—Better	—98°	—97°	
95½°—Quite free	—93°—Perfect	—94½°	—92½°	
95°—Slight- stiff	—93°—Better	—94½°	—92°	
—	—	—	—	
The same	Increased	The same	Almost normal	
Co.—Neu- ral	ditto	ditto	Normal	
aner	The same	Much cleaner	Almost clean	
ther less	Still less	ditto	ditto	
ry good	Very good	Very good	ditto	
ht hours	Six hours	Six hours	Six hours	
en	Regular	ditto	ditto	
o	ditto.—Fish	ditto	ditto	March 18th— L. P. ; March 21st—Chop.

CASE IV.

Admitted.	Name and Occupation.	Age.	Sex.	Constitution.	Number of Attack.	Character of Attack.	Duration of attack previous Admission.
March 15th.	A. D.—Servant.	17	Female.	Robust.	First.	Acute.	Nine days.

March . . .	15th	16th	17th	18th	19th	20th
Pulse . . .	100	100	88	84	92	76
Temp. in Axilla	102°	101°	100°	99°	99½°	98½°
Temperature and mobility of Joints affected.	R. W. —99°—Im-moveable	—98°—The same	—95°—Moveable without pain	—95½°—The same	—97°—Perfect	—94°—Perfect
	L. W. —98°—Im-moveable	—98°—Slightly moveable	—95°—Moveable without pain	—96°—Moveable with pain	—96°—Perfect	—95°—Perfect
	R. K. —99°—Im-moveable	—99½°—Slight motion	—96°—Moveable without pain	—96°	—98°	—96°—Perfect
	L. K. —99°—Im-moveable	—98°—Slight motion	—97°—Moveable without pain	—96°	—97°	—97°—Perfect
	R. A. —99°—Im-moveable	—98°—Slight motion	—94°—Moveable without pain	—94°	—93°	—93½°—Perfect
	L. A. —96°—Im-moveable	—96°—Slight motion	—92°—Moveable without pain	—92°	—91°	—93½°—Perfect
Blisters applied	Six	—	—	—	—	—
Perspiration .	Excessive	Rather less	The same	The same	Still less	Normal
Urino . . .	Scanty, high-coloured, acid	The same—slightly acid	Better colour, quantity increased, neutral	The same, alkaline phosphates, prisms under microscope	Very slightly acid	Normal
Tongue . . .	White and coated at the edges, red down the centre	The same	Cleaner	Almost clean	Quite clean	The same
Thirst . . .	Excessive	The same	The same	Less	Still less	The same
Appetite . . .	Very bad	Bad	Slightly better	The same	Good	Very good
Amount of sleep	None	Did not sleep on account of the blisters	None—was in no pain		Four hours	Six hours
Bowels, Action of	Regular	ditto	ditto	ditto	ditto	ditto
Diet	Milk, Beef-tea	ditto	ditto	ditto	ditto	ditto

C A S E I V.—*Continued.*

Morbus Cordis on Admission.	Days in the Hospital.	Morbus Cordis on Discharge.	Discharged.
None	18	None	April 2nd.

21st	22nd
72	60°
98°	98°
104°	—92°—ditto
103°	—92°—ditto
106°	—94°—ditto
106°	—94°—ditto
109°	—88°—ditto
102°	—89°—ditto
—	—
Normal	ditto
120	ditto
120	ditto
120	ditto
Normal	ditto
Same	ditto
hours	Did not sleep, was in no pain
120	ditto
120, one egg	Chop

CASE V.

Admitted.	Name and Occupation.	Age.	Sex.	Constitution.	Number of Attack.	Character of Attack.	Duration of a tack previous Admission.
April 1st.	A. L.—Servant.	18	Female.	Feeble and delicate.	Second.	Acute.	Ten days.

April . . .	1st	2nd	3rd	4th	5th	6th
Pulse . . .	96	116	88	84	84	82
Temp. in Axilla	102°	102°	101°	100°	99½°	99½°
Temp. & mobility of Joints affected.	L. S. —102°—Moveable with pain R. W. —98°—Immoveable L. W. —99°—Immoveable R. E.	—102° —98° —99½°	—100½° —98° —96½°	—100°—The same —98°—The same —97½°—The same	—101°—The same —97°—The same —96°—The same —97°—Immoveable	—99½° —97° —95° —97°—The same
Blisters applied	Three	—	—	—	One	The same
Perspiration .	Very slight	Normal	The same	Increased	Less	The same
Urino . . .	Good colour, scanty and acid	Normal acidity and colour	The same	ditto	ditto	Normal
Tongue . .	Coated, and inclined to be dry down the centre	Moist and creamy	The same, inclined to be dry again	Moist and beginning to clean	Still cleaning	Moist and white
Thirst . . .	Moderate	Less	ditto	Increased	Less	Still less
Appetite . .	Entirely gone	The same	ditto	Slightly improved	Better	The same
Amount of sleep	None	Did not sleep on account of the blisters	None, was in no pain	Slept at times in the night	No sleep on account of blister	No sleep—was in no pain
Reaction of saliva . . .	Very acid	Acid	Acid	ditto	ditto	ditto
Bowels, Action of	Regular	The same	ditto	ditto	ditto	Confined, H. D.
Diet. . . .	Milk and Beef-tea	ditto	ditto	ditto	ditto	ditto
Remarks . .						

A. L. was allowed to be dressed on April 15th, and to walk about the ward. Being of a weakly constitution, her convalescence was somewhat prolonged; bismuth was given her to allay some irritability of stomach.

The rheumatic attack closed in eight days.

At the period of admission there was a distinct murmur audible at the apex of the heart; and considerable amount of dyspnoea unaccounted for by any marked pulmonary disease. Very probably a fibrinous deposit had taken place on some portion of the valve. By the free discharge of the serum of the blister, the blood resumed its usual alkalinity, the deposit was re-dissolved, and the normal sound at the orifice re-established.

C A S E V.—*Continued.*

Morbus Cordis on Admission.	Days in the Hospital.	Morbus Cordis on Discharge.	Discharged.
Mitral murmur	28	Nono	April 28th.

7th	8th	
83	92	
100°	100°	
99°—The same	—100°—Free	
96°—The same	—95°—Free	
95°—The same	—95°—Free	
96°—Move- able without pain	—98°—Free	
—		
Normal	ditto	
Normal	ditto	
Cleaner and moist	Cleaner	
Normal	Slightly in- creased	
Better	ditto	
Slept better	Slept well	
Neutral	Acid	
Regular	ditto	
to, Egg	ditto	9th Sherry 3iij 11th Strong broth 14th Fish 22nd Chop

CASE VI.

Admitted.	Name and Occupation.	Age.	Sex.	Constitution.	Number of Attack.	Character of Attack.	Duration of attack previous Admission.
April 1st.	W. A.—Carpenter.	19	Male.	Robust.	First.	Acute.	Six days.

April . . .	1st	2nd	3rd	4th	5th	6th
Pulse . . .	80	80	84	68	72	68
Temp. in Axilla	103°	101°	101°	100°	99½°	98°
Temperature and mobility of joints affected.	R. S.	—102°—Moveable with great pain	—101°—Moveable with slight pain	—102°—Freely moveable	—99°—The same	—98°—The same
	R. W.	—100°—Immoveable	—97°—Moveable with slight pain	—99°—Freely moveable	—95°—The same	—92°—Free
	L. W.	—100°—Immoveable	—97°—The same	—98°—Moveable with slight pain	—96°—The same	—92°—Moveable with slight pain
	R. K.	—100°—Immoveable	—96°—The same	—98°—The same	—97°—The same	—95°
	L. K.	—100°—Immoveable	—96°—Moveable with slight pain	—98°—The same	—96½°—The same	—96°
	R. A.	—98°—Immoveable	—88½°—Immoveable	—95°—Freely moveable	—93½°—Free	—94°—The same
	L. A.	—99°—Immoveable	—85°—Freely moveable without pain	—94°—The same	—92°—The same	—94°—The same
Blisters applied	Seven	—	One	Two		
Perspiration .	Excessive, acid	Less, acid	Slight	The same.—Neutral	Increased	The same—neutral
Urino . . .	High coloured, acid, rather scanty	Good colour and quantity, acid	High coloured, scanty, acid	The same	Better colour and quantity, neutral	The same
Tongue . . .	White and coated except at top	Beginning to clean at sides	Moist and creamy	Beginning to clean	Much cleaner	Still cleaning
Thirst . . .	Excessive	The same	Less	The same	ditto	Very slight
Appetite . .	Very bad	The same	The same	The same	Better	Good
Amount of sleep	Had not slept for a week	Did not sleep on account of blisters	Six hours	No sleep on account of blisters	None—slight pain	Slept all night
Reaction of saliva . . .	Acid	Acid	Acid	ditto	ditto	Acid
Bowels, Action of	Regular	Regular	Confined	Regular	Regular	ditto
Diet	Milk, Beef-tea	ditto	ditto	ditto	ditto	ditto

Perfect.

CASE VI.—Continued.

Morbus Cordis Admission.	Days in the Hospital.	Morbus Cordis on Discharge.	Discharged.
Mitral murmur	16	None.	April 16th.

7th	All joints freely moveable without pain.
60	
98°	
8°	
0°	
10°	
15°	
20°	
25°	
30°	
Normal	
same	
most clean	
normal	
7 God	
hours	
normal	
o, L. P. ; 3a (2)	9th Sherry, 3iij 14th Middle diet

CASE VII.

Admitted.	Name and Occupation.	Age.	Sex.	Constitution.	Number of Attack.	Character of Attack.	Duration of attack previous Admission
April 19th	M. A.—Servant.	20	Female	Robust.	First.	Acute	Three day

April . . .	19th	20th	21st	22nd	23rd	24th	
Pulse . . .	112	120	106	92	96	88	
Temp. in Axilla	102°	102°	100½°	101°	100°	98½°	
Temperature and mobility of joints affected.	R. S.	—102°—Moveable with pain	—102°—The same	—100½°—Moveable with slight pain	—101°—Free from pain	—100°—Much freer movement	—98½°
	L. S.	—102°—Moveable with pain	—102°—The same	—101°—Moveable with slight pain	—101½°—Free from pain	—100°—Much freer movement	—98°
	R. E.		—101°—Moveable with pain	—99°—The same	—100°—The same	—99°—Free from pain	—97°
	R. W.			—98°—Moveable with great pain	—99°—The same	—99°—Moveable without pain	—97°—The same
	R. K.	—100°—Immoveable	—100½°—ditto	—98°—More movement	—99°	—99°	—98°—Moveable with slight pain
	L. K.	—98°—Immoveable	—101½°—ditto	—97°—The same	—100°	—98°	—98°
	R. A.	—98°—Immoveable	—100°—ditto	—94°—More movement	—94°	—95°	—91½°
L. A.	—99°—Immoveable	—100°—ditto	—94°—The same	—94°	—95°	—91½°	
Blisters applied	Six	One	One				
Perspiration .	Excessive	The same, acid	The same	ditto	Less, slightly acid	Still less	
Urine . . .	Scanty, high-coloured	The same—turbid and very acid	The same, slightly acid	ditto, clear, neutral	Good colour and quantity, slightly acid	The same	
Tongue . . .	Coated and furred	The same	ditto	Cleaner	The same	Much cleaner	
Thirst . . .	Excessive	The same	ditto	ditto	ditto	ditto	
Appetite . . .	Very bad	ditto	ditto	Bad	Rather better	Much better	
Amount of sleep	Had not slept for three nights	Did not sleep on account of the blisters	Slept one hour	ditto	Did not sleep, was in no pain	Three hours	
Reaction of saliva . .	Highly acid	Slightly acid	Acid	The same	ditto	ditto	
Bowels, Action of	Regular	Confined	Open	Confined	ditto, H.D., 3j.	Regular	
Diet	Milk, Beef-tea	ditto	ditto	ditto	ditto	ditto	

slightly sour.

the same.

CASE VII.—*Continued.*

Morbus Cordis on Admission.	Days in the Hospital.	Morbus Cordis on Discharge.	Discharged.
None	21	None	May 10th

25th	26th	27th	28th	
84	76	72	72	
98°	98°	97°	99°	
8°—The me	—98°—ditto	—97°	—99°—Perfect	Perfectly free.
8°—The me	—98°—ditto	—97½°	—99°—Perfect	
6°—The me	—96°—ditto	—96½°	—96°—Perfect	
5½°—The me	—94°—ditto	—94°	—94°—Perfect	
5°	—95°	—95½°	—95°—Perfect	Perfect.
6½°	—96°	—95½°	—95°—Perfect	
3°	—90°	—89°	—89½°—Perfect	
3°	—91°	—89½°	—91°—Perfect	
o	ditto	Very slight	Normal	
o	The same	Normal	Normal	
o	ditto	Almost clean	Quite clean	
o	Less	Slight	Normal	
o	Good	Good	Very good	
tr hours	Six hours	Six hours	Five hours	
o	ditto	ditto	Neutral	
o	ditto	ditto	ditto	
o	ditto	ditto, L. P.	ditto	
May 2, Fish May 9, Middle diet				

CASE VIII.

Admitted.	Name and Occupation.	Age.	Sex.	Constitution.	Number of Attack.	Character of Attack.	Duration of attack previous Admission.
April 20th	M. B — Married	28	Female	Thin and pale; weakly & highly hysterical	First	Acute	Six days; ill three months previous

April . . .	21st	22nd	23rd	24th	25th	26th
Pulso . . .	120	108	100	94	84	84
Temp. in Axilla	100½°	100°	100°	98½	98°	97½°
Temperature and mobility of joints affected.	R. S. —100½°—Im-moveable L. S. —100½°—Im-moveable R. E. —100°—Im-moveable L. E. —100°—Im-moveable R. K. —99°—Im-moveable L. K. —100°—Im-moveable R. A. —98°—Im-moveable	—100° —99° —98° —99° —95° —96° —88°	—100° —100° —99° —98° —97° —97° —93°	—98½°—The same —100°—The same —98°—The same —97½°—The same —96° —96° —94°	—98° —98° —98° —97½°* —96° —96½° —90°	—97½° —96½° —94° —94° —94° —91°
		Moveable without pain, slightly stiff.	Moveable but stiff.	Moveable without stiffness or pain.	The same.	without pain.
Blisters applied	Seven	—			One	
Perspiration .	Moderate, acid	Excessive	Less	Excessive	ditto	Less
Urine . . .	High coloured, scanty	The same, slightly acid	Better colour and quantity, slightly acid	The same	ditto	Normal
Tongue . .	Moist and slightly coated	The same	The same	ditto	Cleaner	Much cleaner
Thirst . . .	Excessive	The same	ditto	Less	ditto	Less
Appetite . .	Very bad	The same	ditto	ditto	ditto	Better
Amount of sleep	One hour	Did not sleep on account of blisters	Three hours	Did not sleep, was in no pain	Slept a little	ditto
Reaction of saliva . .	Acid	Acid	ditto	ditto	ditto	ditto
Bowels, Action of . . .	Confined, H. D., 3j.	Open	Confined, H. D., 3j.	Open	Open	Confined, H. D., 3j.
Diet . . .	Milk and Beef-tea	ditto	ditto	ditto	ditto	ditto, L. P.
Remarks . .						

* 97½ moveable with pain.

CASE VIII.—*Continued.*

Morbus Cordis Admission.	Days in the Hospital.	Morbus Cordis on Discharge.	Discharged.
None	40	None	May 30th

27th	28th	29th	30th	
88	84	88	81	
98°	99°	98°	99°	
3° { The same. Better.	—99°—The same	—98° { Better.	—99°—ditto	<p>Although much immediate benefit was derived in this case, from the treatment, still two relapses occurred—May 9th, in the left wrist (which had not been previously attacked), and again on May 21st, though very slightly. She left the Hospital cured, May 30th.</p>
3° { The same.	—98°—The same	—97° {	—99°—ditto	
7° {	—96°—The same	—98° {	—98°—ditto	
7° {	—98°—The same	—98° {	—98°—ditto	
6° {	—96° { The same.	—96° {	—96° { Moveable but very slightly stiff.	
4° {	—96° {	—96° {	—96½° {	
2° {	—93° {	—92° {	—93° {	
essive	The same	ditto	Slight	
	ditto	ditto	Normal	
	Clean	ditto	ditto	
	Increased	The same	Less	
	ditto	Good	Good	
not sleep, s in no n	No sleep	Four hours	Five hours	
	ditto	ditto	ditto	
, H.D., 3j.	ditto, H.D. 3j.	ditto, H.D., 3j.	Open	
	ditto	ditto	ditto	

CASE IX.

Admitted.	Name and Occupation.	Age.	Sex.	Constitution.	Number of Attack.	Character of Attack.	Duration of attack previous to Admission.
April 26th	H. S.—Labourer	30	Male	Delicate	Second	Acute	Seven days

April . . .		27th	28th	29th	30th	May 1st	2nd
Pulse . . .		88	88	92	88	93	96
Temp. in Axilla		102°	101°	101½°	101°	101°	100°
Temperature and Mobility of Joints affected.	R. E.	—100°—Immoveable	—100°—Moveable without pain	—100°—Freely moveable	—100½°	—100°	—100°
	L. E.	—99°—Moveable with slight pain	—99°—Moveable without pain	—100°—Freely moveable	—101°	—100°	—98°
	R. W.	—99°—Immoveable	—99°—Moveable with pain	—96°—Freely moveable	—99°	—98°	—99°
	R. K.	—100°—Immoveable	—99°	—98°—Freely moveable	—97°	—98°	—97°
	L. K.	—100°—Immoveable	—97°	—98°—Freely moveable	—98°	—98°	—96°
	R. A.	—96°—Immoveable	—94½°	—95½°—Freely moveable	—95½°	—95°	—95°
	L. A.	—97°—Immoveable	—95°—Moveable with slight pain	—96°—Freely moveable	—95°	—95°	—94°
Blisters applied		Seven					
Perspiration .		Excessivo, acid	The same	ditto	ditto	Less	Increased
Urine . . .		Scanty, high-coloured, slightly acid	The same—neutral	Better colour, quantity increased, alkalino triple phosphates under microscope	The same	Slightly high-coloured, neutral	The same
Tongue . .		Moist and white	The same	Beginning to clean	The same	Cleaner	The same
Thirst . . .		Excessivo	The same	ditto	ditto	ditto	ditto
Appetite . .		Very bad	The same	ditto	ditto	Better	ditto
Amount of sleep		None	Did not sleep on account of blisters	Three hours	None, was in no pain	Two hours	Slept near all night
Reaction of saliva . . .		Acid	ditto	ditto	ditto	ditto	ditto
Bowels, Action of . . .		Confined, H.D., 3j.	Open	ditto	Confined, H.D., 3j.	Confined, H.D., 3j.	Open freely
Diet. . . .		Milk and Beef-tea	ditto	ditto	ditto	ditto	ditto

CASE IX.—Continued.

Morbus Cordis Admission.	Days in the Hospital.	Morbus Cordis on Discharge.	Discharged.
Direct aortic murmur	20	Direct aortic murmur	May 16th

3rd	4th	
84	72	
99°	99½°	
84		
84		
84		
same	ditto	
	Normal	
same	Much cleaner	
	Less	
er	Much better	
at a great al in the y	Slept well	
	ditto	
	Regular	May 7, Fish, May 11, Light Pudding, May 13, Mid- dle diet and Sherry 3iij.
	ditto	

CASE X.

Admitted.	Name and Occupation.	Age.	Sex.	Constitution.	Number of Attack.	Character of Attack.	Duration of attack previous Admission.
May 14th	F. C.—Domestic	20	Female	Robust	Second	Acute	Four days

May . . .	14th	15th	16th	17th	18th	19th
Pulse . . .	120	112	116	100	112	96
Temp. in Axilla	102°	102°	102°	100°	100°	100°
Temperature and mobility of Joints affected.	R. W.	—100°—Im-moveable	—100°—Im-moveable from blisters	—99·5°	—98°	—100°
	L. W.	—100°—Im-moveable	—102°—Im-moveable from blisters	—100·5°	—100°	—99 5°
	R. K.	—96·5°—Moveable with great pain	—94°	—100°	—98·5°	—99°
	L. K.	—97°—Moveable with great pain	—100°	—91·5°	—100°	—100°
	R. A.	—97°—Moveable with pain	—96°	—97·5°	—96°	—97°
	L. A.	—98°—Moveable with pain	—98°	—67°	—97°	—98°
Blisters applied	Six	Two (dorsum of hand)				
Perspiration .	Excessive	ditto, less acid	Less	Normal	ditto	ditto
Urine . . .	Not tested—(Catamenia)		Colour normal and slightly acid	Normal	ditto	ditto
Tongue . . .	Moist and white	ditto	ditto	Cleaning	Cleaner	Cleaning
Thirst . . .	Excessive	ditto	ditto	Less	ditto	Less
Appetite . . .	Fair	Bad	Fair	ditto	ditto	Better
Amount of sleep	None for four days	None	Three hours	Little	ditto	ditto
Bowels, Action of	Confined	ditto	Open	Open	Open	Open
Diet	Milk and Beef-tea	ditto	ditto	ditto, with Light Pudding	ditto	ditto
Reaction of Saliva . .	Very acid	ditto	Slightly acid	Same	Very acid	Acid
Remarks . .						

CASE XI.

Admitted.	Name and Occupation.	Age.	Sex.	Constitution.	Number of Attack.	Character of Attack.	Duration of attack previous Admission.
May 17th	H. A.—Married	28	Female	Weakly	Sixth	Acute	Fourteen d.

May . . .	18th	19th	20th	21st	22nd	23rd
Temp. of ward	72°	76°	72°	72°	69°	70°
Pulse . . .	119	124	100	108	120	100
Temp. in Axilla	103½	102°	101°	102°	98°	103°
Temperature and mobility of joints affected.	R. W. —102½—Im-moveable	—99°	—100°	—99°	—98°	—98°—Moveable with slight pain
	L. W. —100°—Moveable with pain	—98°	—100°	—98°	—98°	—97°—Moveable with slight pain
	R. K. —99½°—Moveable with great pain	—100°	—99°	—98°	—96°	—98°
	L. K. —99°—Moveable with great pain	—98°	—100°	—100°	—95½°	—98°
	R. A. —96½°—Moveable with great pain	—99°	—98°	—98°	—96°	—98°
	L. A. —96½°—Moveable with great pain	—98°	—98°	—99½°	—95·5°	—98°
Blisters applied	Six			One on dorsum of left wrist		
Perspiration .	Excessive	The same	The same	The same	Less	Normal
Urine . . .	Neutral—had been treated with alkalies	Not kept	Neutral, thick, and high-coloured	ditto	Faintly acid	Very scanty, high colour
Tongue. . .	Creamy	The same	ditto	ditto	Cleaner	Cleaner
Thirst . . .	Excessive	Less	Excessive	ditto	Less	ditto
Appetito . .	Very bad	ditto	Slightly better	ditto	More	Improving
Amount of sleep	None	Did not sleep on account of the blisters	Hardly slept	None	Badly	Badly
Reaction of saliva. . .	Acid	Acid	Acid	Acid	Very acid	Acid
Bowels, Action of	Confined	Open	Confined	Open (by purge)	Open	Open
Diet. . . .	Milk, Beef-tea	ditto	ditto with L.P.	ditto	ditto	ditto
Remarks . .		She states that she has now "no rheumatism at all."				

C A S E X I.—*Continued.*

Morbus Cordis Admission.	Days in the Hospital.	Morbus Cordis on Discharge.	Discharged.
Mitral regurgitant	30	Mitral regurgitant	June 16th

24th	25th	26th	27th	28th	29th
70°	65°	62°	62°	64°	62°
120	120	104	80	100	100
100°	100°	100°	98°	102°	100°
8°—Painful	—98°	—98°	—94°—Moveable	—99°—Very painful	—99°
8°—Painful	—100°	—96°	—94°—Moveable	—101½°—Very painful	—99°
3°	—96°	—94°	—95°—Moveable with pain	—97°—Stiff	—96°
3°	—98°	—94°	—95°—Moveable with pain	—98°—Stiff	—96°
4°	—96°	—96°	—94°—Moveable	—96°—Very painful	—92°
3°	—96°	—96°	—96°—Moveable	—97°—Very painful	—92°
				Four	
	ditto	ditto	ditto	Less	ditto
	Alkaline	Alkaline	Neutral	Acid, thick with urates. and scanty	Alkaline
ner	Clean	Creamy	Cleaner	Creamy	Cleaning
	Thirsty	ditto	Thirsty	ditto	Less
er	ditto	ditto, hungry	Hungry	No appetite	Better
e	Little	Little	Little	Hardly any	Very little
	Acid	Acid	Acid	Acid	Acid
	Confined	Open	Open	Open	Open
	do. with L. P.	ditto	ditto with Fish	No Fish	ditto

All Moveable.

Moveable.

Moveable with pain.

All moveable though rather painful.

C A S E X I.—*Continued.*

Admitted.	Name and Occupation.	Age.	Sex.	Constitution.	Number of Attack.	Character of Attack.	Duration of attack previous Admission.
May 17th	H. A — Married	28	Female	Weakly	Sixth	Acute	Fourteen days

May . . .	30th	31st	June 1st	2nd	3rd	4th
Temp. of ward	62°	62°	61°	60·5°	61°	60°
Pulse . . .	100	80	80	80	100	90
Temp. in Axilla	98°	100°	100°	98°	99°	100°
Temperature and mobility of joints affected.	{ R. W. —95° L. W. —95° R. K. —96° L. K. —96° R. A. —92° L. A. —92°	{ —100° —98° —98° —98° —93° —95°	{ —99° —99° —96° —96° —96° —96°	{ —98° —99° —96° —96° —88° —88°	{ —99° —99° —95° —95° —94° —94°	{ —99° —98° —94° —94° —92° —92°
	All moveable but stiff.	All moveable and less stiff.	Less stiff.	All moveable pretty freely.	The same.	More easily moved.
Blisters applied						
Perspiration .	Increased	Less	ditto	Little	ditto	ditto
Urine . . .	Acid	Alkaline	Acid (faintly)	Acid	Acid (faintly)	Alkaline
Tongue . .	Cleaning	ditto	ditto	ditto	ditto	Clean
Thirst . . .	Less	ditto	ditto	Normal	ditto	Normal
Appetite . .	Better	ditto	ditto	ditto	ditto	ditto
Amount of sleep	A little more	ditto	ditto	Fair	ditto	ditto
Reaction of saliva . . .	Acid	ditto	Acid	Acid	ditto	Acid
Bowels, Action of	Confined	Confined	Open	Open	ditto	Confined
Diet . . .	Milk, Beef-tea	ditto with Fish	ditto	ditto	ditto	ditto

C A S E X I.—*Continued.*

Morbus Cordis Admission.	Days in the Hospital.	Morbus Cordis on Discharge.	Discharged.
Mitral regurgitant	30	Mitral regurgitant	June 16th

5th	6th	7th	
65°	67°	Sits up daily	
100	100		
99°	98°		
All moveable.	—97°		All freely moveable ; no pain.
	—96°		
	—96°		
	—96°		
	—94°		
	—95°		
	ditto		
(faintly)	ditto		
	ditto		
	ditto		
	ditto		
	ditto		
	ditto		
	ditto		
	Open		
	ditto (Chop)		

CASE XII.

Admitted.	Name and Occupation.	Age.	Sex.	Constitution.	Number of Attack.	Character of Attack.	Duration of attack before Admission.
May 28th	E. K.—Domestic	18	Female	Well nourished	Fifth	Very acute	Three days

May . . .	28th	29th	30th	31st	June 1st	2nd	3rd
Temp. of ward	62°	62°	62°	62°	61°	60.5°	61°
Pulse . . .	120	112	100	120	100	96	100
Temperature of Mouth .	100°	100°	99°	99°	99°	100°	100°
Joints affected and temperatures.	Rt. Ax. —102°	—101°	—100°	—101°	—101°	—102°	—101°
	L. Ax. —101°	—101°	—100°	—100°	—100°	—102°	—100°
	Rt. El. —99°	—100°	—98°	—100°	—96°	—100°	—98°
	L. El. —100°	—98°	—98°	—100°	—98°	—100°	—99°
	R. W. —97°	—94°	—94°	R. W. painful	—93°	—98°	—95° (stiff)
	L. W. —95°	—94°	—94°	L. W. painful	—93°	—98°	—95°
	R. K. —95°	—94°	—94°	—96°	—93°	—98°	—95°
	L. K. —95°	—94°	—94°	—96°	—93°	—98°	—95°
	R. A. —95°	—94°	—94°	—96°	—93°	—98°	—95°
	L. A. —95°	—94°	—94°	—96°	—93°	—98°	—95°
Blisters applied	Six — Two Wrists, two knees, two ankles		One—Right Ankle	Two—wrists			
Perspiration .	Profuse, acid	Less	ditto	ditto	More	Less	ditto
Urine . . .	Very acid	Slightly acid	ditto	Very acid	Acid (less)	Normally acid	ditto
Tongue . . .	Creamy	ditto	ditto	Cleaning	ditto	ditto	ditto
Thirst . . .	Excessive	ditto	Rather less	More	ditto	ditto	ditto
Appetite . . .	Bad	Better	ditto	Less	Poor	Better	ditto
Amount of sleep	None	Little	Little	More	Little	Greater	ditto
Reaction of Saliva . .	Very acid	Acid	ditto	ditto	Acid	ditto	ditto
Bowels, Action of . . .	Open	Confined	ditto	Open	Open	Open	ditto
Diet . . .	Milk and Beef tea	ditto	ditto	ditto	ditto	ditto	ditto

CASE XII.—Continued.

Morbus Cordis Admission.	Days in the Hospital.	Morbus Cordis on Discharge.	Discharged.
Mitral gurgitant	28	Mitral murmur	June 25th

4th	5th	6th	7th	8th	9th	10th	11th
60°	65°	65°	74°	69°	69°	67°	69°
100	100	100	100	90	90	80	90
99°	101°	99°	100°	99°	99°	98°	98°
100°	—101°	—99°	—100°	—100°	—99°	—99°	—98°
100°	—101°	—99°	—100°	—99°	—99°	—99°	—98°
100°	—101°	—99°	—100°	—98°	—99°	—98°	—97°
100°	—101°	—99°	—100°	—98°	—99°	—98°	—97°
All joints freely moveable.	—98°	R. W. painful	All again moveable.	L. S. painful	All joints are moveable.	Ditto.	Quite free from pain and all moveable.
	—96°	—96°—R. K. painful		L. W. painful			
	—96°	—95° Other joints moveable.		—94°			
		Two—R. W. and R. K.		Two—Left Shoulder and wrist			
ditto	ditto	ditto	ditto	ditto	Less	Rather more	Less
ditto	ditto	ditto	ditto	ditto	Faintly acid	ditto	ditto
ditto	ditto	ditto	ditto	ditto	ditto	ditto	ditto
ditto	ditto	ditto	Less	ditto	ditto	ditto	Less
Better	ditto	ditto	ditto	ditto	Better	Good	Very hungry
ditto	ditto	ditto	ditto	ditto	Good	ditto	Good
ditto	ditto	ditto	ditto	ditto	ditto	ditto	Faintly acid
ditto	ditto	ditto	ditto	ditto	Open	ditto	Open
ditto, with Pudge	ditto	ditto	ditto, with two Eggs	ditto	ditto	ditto	ditto, (Fish)

CASE XIII.

Admitted.	Name and Occupation.	Age.	Sex.	Constitution.	Number of Attack.	Character of Attack.	Duration of a tack previous Admission.
June 2nd	J. B.— Carpenter	23	Male	Plethoric.	First (doubtful history of one in childhood)	Very acute	Fourteen da

Date . . .	June 2nd	3rd	4th	5th	6th	7th.	
Temperature of Ward . .	61°	62°	62°	64°	64°	70°	
Pulse . . .	120	120	86	80	80	80	
Temperature of month .	Not taken	103°	100°	100°	99°	99°	
Joints affected and temperature.	R. A.	Not taken	—99.3°	—100.8°	—100°	—101°	—100°
	L. A.	Not taken	—102.5°	—100.8°	—99.6°	—101°	—99.7°
	R. E.	Not taken	—100°	—96.4°	—99°	—99.5°	—98.7°
	L. E.	Not taken	—99°	—98°	—99°	—99.7°	—99.2°
	R. K.	All intensely painful and immoveable.	—96°	—97.6°	—97°	—97°	—98°
	L. K.		—95°	—98°	—97°	—97°	—98°
	R. A.		No better than before.	All less painful.	All joints move-able.	All freely move-able	All joints pain.
	L. A.						
	R. W.						
	L. W.						
L. S.							
Blisters applied		Seven — (All affected joints)					
Perspiration .	Profuse and acid	Less	More	ditto	ditto	ditto	
Urine . . .	Very acid	ditto	Alkaline	Faintly acid	Acid (normal)	ditto	
Tongue . .	Foul	ditto	Cleaning	ditto	ditto	ditto	
Thirst . . .	Excessive	ditto	Rather less	More	ditto	ditto	
Appetite . .	No appetite	Poor	Better	ditto	ditto	ditto	
Amount of sleep	None for four nights	A little from morphia	A little	Slept well	ditto	ditto	
Reaction of saliva . . .	Very acid	ditto	Alkaline	Faintly acid	Acid	Acid	
Bowels, Action of	Confined	ditto	ditto	ditto	ditto	Open	
Diet	Milk and Beef-tea	ditto	ditto	ditto	ditto, with Eggs	ditto, with Fish	

CASE XIII.—*Continued.*

Morbis Cordis Admission.	Days in the Hospital.	Morbis Cordis on Discharge.	Discharged.
None	16	None	June 18th

8th	9th
68°	67°
80	80
99·7°	95°
	—99·5°
7°	—99·5°
	—99°
	—98·5°
	—95°
	—95°
Ditto; sat up.	Ditto, and dressed himself.
	ditto
line	Neutral
	Clean
	ditto
hungry	Good
	ditto
	Acid (slightly)
twice	Open
	ditto

OBSERVATIONS OF TEMPERATURE IN HEALTHY PERSONS,
DURING MAY AND JUNE, 1864 (FAHRENHEIT'S THERMOMETER).

No	Sex.	Age.	Pulse.	Respirations.	Temp. of Apartment.	Time of Day.	Temperature of Month.	Temp. of Right Axilla.	Left Axilla.	Right Elbow.	Left Elbow.	Right Knee.	Left Knee.	Cleft of Right Great Toe.	Cleft of Left Great Toe.	Habit of Body.
1	F	9	90	20	62°	9.0 a.m.	97°	96°	96°	93°	93°	91.5°	91.5°	73°	74°	Thin
2	M	22	80	18	62°	9.0 a.m.	97°	96°	96°	94°	94°	93°	93°	74°	75°	Stout
3	M	17	85	20	62°	9.30 a.m.	96°	94°	94°	94°	94°	93°	93°	89°	89°	Thin
4	F	28	80	18	68°	10.0 a.m.	96°	96°	96°	93°	93°	94°	94°	70°	70°	Stout
5	F	10	90	18	63°	10.0 a.m.	96°	95°	93°	91°	88°	92°	92°	72°	72°	Thin
6	F	9	90	20	62°	10.30 a.m.	96°	95°	95°	93°	93°	94°	94°	73°	74°	Do.
7	F	19	80	20	62°	10.0 a.m.	96°	97°	97°	92°	92°	90°	90°	80°	80°	Stout
8	F	5	100	20	62°	9.0 a.m.	96°	96°	96°	94°	94°	94°	94°	72°	72°	Thin
9	M	29	80	18	62°	8.30 a.m.	96°	98°	97°	96°	96°	95°	95°	80°	78°	Stout
10	M	42	80	16	62°	8.0 p.m.	97°	97°	97°	93°	95°	94°	94°	78°	76°	Thin
11	M	4	100	20	62°	10.0 a.m.	97°	97°	97°	96°	96°	94°	94°	80°	80°	Do.
12	M	28	70	16	59°	11.0 p.m.	98°	96°	96.5°	94°	94°	91.5°	91°	87°	87°	Do.
13	F	6	100	20	61°	7.0 p.m.	97°	97.5°	97.5°	95°	95°	95.5°	97°	83°	85°	Do.
14	F	11	80	18	62°	4.0 p.m.	97°	97°	97.5°	95.4°	95.6°	91.5°	91.5°	72°	73°	Do.
15	M	27	80	16	60°	8.0 p.m.	97°	96.5°	96.5°	95°	96.5°	95°	95°	90°	90°	Stout
16	M	19	80	18	63°	7.0 p.m.	97°	96.5°	96.5°	96°	96°	92°	92°	88°	89°	Thin
17	F	19	80	20	65°	9.0 p.m.	96°	99°	99°	96°	96°	94°	94°	92°	92°	Stout
18	M	22	80	24	67°	7.0 p.m.	93°	99°	98.7°	99°	98.5°	96°	96°	94°	94°	Thin
19	M	28	70	16	66°	10.0 p.m.	98°	97.9°	97.8°	95.3°	95.6°	94°	93°	90°	90°	Do.
20	F	44	80	16	69°	7.0 p.m.	96°	98.3°	98°	96.5°	96°	96°	96°	92°	92°	{ Very stout }

SUMMARY.

Parts experimented on.	Month	Right Axilla.	Left Axilla.	Right Elbow.	Left Elbow.	Right Knee.	Left Knee.	Right Toes.	Left Toes.
Highest temperature	98°	99°	99°	99°	98.5°	96°	97°	94°	94°
Lowest temperature..	93°	94°	93°	91°	88°	90°	90°	70°	70°
Average of twenty cases	96.4°	96.7°	96.6°	94.5°	94.9°	93.3°	93.3°	81.4°	81.6°

CONCLUSIONS.

1st. That the number of facts is too small to fix any absolute standard of temperature for health; but that,

2nd, The temperature of the two sides of the body is apparently nearly identical; and that,

3rd. In healthy individuals, the temperature of the apartment has but slight influence on that of the blood; and

4th, That (as far as these Tables show) the influence of sex upon temperature is not well marked, being perhaps a trifle in favour of the male sex; and further,

5th, That, taking all the parts together, the average temperature of the body is less in childhood than in adult ages.